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10/588,507	10/27/2007	Takafumi Matsumoto	029567-00009	9804
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AREN'T FOX LLP			EXAMINER	
1050 CONNECTICUT AVENUE, N.W.			HILTON, ALBERT	
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WASHINGTON, DC 20036			ART UNIT	PAPER NUMBER
			1716	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/588,507	Applicant(s) MATSUMOTO ET AL.
	Examiner Albert Hilton	Art Unit 1716

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 15 December 2010.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-12, 14 is/are rejected.
- 7) Claim(s) 13,15 and 16 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftperson's Patent Drawing Review (PTO-942)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7, 9-10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maydan (US Patent No. 5224809) in view of Coomer (US Patent No. 20020064450).

1. Regarding claim 1, it is noted that the recitation of a “means for securing” appears to invoke the provisions of 35 U.S.C. 112, 6th paragraph, and has been interpreted in accordance with the disclosure to refer to a securing device (Specification: paragraph 40) or art-recognized equivalent means.
2. Further regarding claim 1, Maydan describes an apparatus comprising a plurality of substrates (**wafers 17**) held on the outer circumferential surface of a cylindrical substrate holder (**hexode 18**) that is rotatable about a rotating shaft (*i.e.*, the base of

hexode 18) while the substrate holder (**18**) is rotated in an evacuable chamber (**chamber 6**) (column 7, lines 25-39 and Fig. 1), the apparatus further comprising a transferring device (**robot 60, robot actuator arm 64**) that transfers a substrate that is removably securable onto the outer circumferential surface of the substrate holder (**18**) in the evacuable chamber (**6**) (column 8, lines 55-68 to column 9, lines 1-24, column 9, lines 54-68, and Figs. 5, 21), and a means for releasably securing (**wafer clips 50**) the substrate transferred by the transferring device (**60**) onto the circumferential surface of the substrate holder (**18**) (column 8, lines 34-55 and Figs 2, 4).

3. The cylindrical substrate holder (**18**) of Maydan is oriented with the rotating shaft of the holder in a vertical direction, rather than in a horizontal direction (Fig. 1). However, rotating the substrate holder such that the shaft is oriented in a horizontal direction would represent an obvious rearrangement of parts that would not alter the operation of the apparatus in a patentably distinct way over the prior art (see MPEP 2144.04).

4. Further regarding claim 1, Maydan describes a transferring device (**60, 64**) provided outside the evacuable chamber (**6**) (see Maydan: Fig. 5), but does not describe the use of a transferring device comprising an arm insertable into a gap between the substrate holder and the substrate itself. However, the use of such a substrate transferring system was known in the art at the time of the invention, as is taught for example by Coomer. Coomer teaches a transferring device (**wafer transfer mechanism 210**) comprising an arm (**arm 212**) in which the substrate is supported by outrigger arms (**205**) that are inserted into a gap (**grooves 262, 263**) between the

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substrate and the substrate holder (**chuck 259**) (Coomer: paragraphs 54, 56-57, and Figs. 4-5).

5. One of ordinary skill in the art at the time of the invention would readily appreciate that the substitution of the wafer transfer arm of Coomer into the apparatus of Maydan would represent a known wafer transfer system used for the same intended purpose, and that such a substitution would not alter the operation of the apparatus in a patentably distinct way or produce any new and unexpected results (see MPEP 2144.07).

6. Further regarding claim 1, the transfer arm (**212**) of Maydan in view of Coomer, when holding the substrate, is transferred along the outer circumferential surface of the cylindrical substrate holder (**18**) in a direction parallel with the rotating shaft (Coomer: Fig. 4, Maydan: Fig. 1), and the substrate, which is transferable by the transferring device (**210**), is fixable to the cylindrical substrate holder (**18**) by the means for releasably securing (**wafer clips 50**) (Maydan: column 8, lines 34-55 and Figs 2, 4).

7. Regarding claim 2, the substrate holder (**18**) of Maydan in view of Coomer is installed rotatably about a horizontal rotating shaft (see paragraph 3 above, and Maydan: column 7, lines 25-39 and Fig. 1), and the transferring device (**210** of Coomer) transfers the substrate in a horizontal direction.

8. Regarding claim 3, the transferring device (**210**) of Maydan in view of Coomer transfers one of the substrate fixing jig and the substrate itself in an axial direction of the rotating shaft (see paragraph 3 above).

9. Regarding claim 4, modifying the apparatus of Maydan such that the shaft rotates about a horizontal axis would result in an apparatus in which the transferring means (60) transfers the substrate in a direction parallel to the outer circumferential surface of the substrate holder (8) (Fig. 1). Such an alteration would represent an obvious rearrangement of parts that would not alter the function of the apparatus in a patentably distinct way or produce any new and unexpected benefit (see MPEP 2144.04).

10. Regarding claim 5, both the transferring action of the transferring device and the securing action by the means for releasably securing the substrates in the apparatus of Maydan in view of Coomer are performed in a depressurized environment, in that the **chamber 6** is evacuated by **turbo pump 31** and **chamber 7** is evacuated by **cryo pump 34** (column 7, lines 50-66, Fig. 1).

11. Regarding claim 6, the releasing action of the means for releasably securing (**clips 50**) substrates is actuated by a robot (60) that is controlled by an electric signal from a controller (**controller 10**) (column 15, lines 61-68, column 17, lines 52-61).

12. Regarding claim 7, the means for releasably securing in the apparatus of Maydan in view of Coomer comprises a mechanism to hold the substrate by pressing with a retaining member means (**clip 50, spring 54**), and a mechanism to release the substrate from the holding by compressing the retaining means member by a drive unit (**actuating arm 64**, which compresses **spring 54**) mounted outside of the substrate holder (column 8, lines 47-59, column 9, lines 1-5, and Fig. 4).

13. Regarding claim 9, the transferring device of Maydan in view of Coomer is installed in a transferring chamber (**robot 60, robot actuator arm 64**) is installed in a transferring chamber (**chamber 7**) that is connected to the evacuable chamber (**chamber 6**) via a valve (**gate valve assembly 9**) (column 7, lines 2-5, column 8, lines 55-68 to column 9, lines 1-24, and Fig. 1). The transferring chamber (7) is evacuable via **cryo pump 34** (column 7, lines 50-66, Fig. 1).

14. Regarding claim 10, Maydan in view of Coomer describes a transferring chamber (**chamber 7**) connected to an evacuable chamber (**chamber 6**) via a valve (**gate valve assembly 9**) (column 8, lines 55-68 to column 9, lines 1-24, and Fig. 1), but does not explicitly describe a further evacuable load/unload chamber connected to the transferring chamber via a valve. However, the use of another evacuable chamber connected via a valve would represent an obvious duplication of parts that would not alter the operation apparatus in a patentably distinct way over the apparatus of Maydan in view of Coomer (see MPEP 2144.04).

15. Regarding claim 14, Maydan in view of Coomer describes a means for releasably securing (**clip 50**) comprising an upper securing member (**50**) and a lower securing member (**pedestal 22**) (column 8, lines 44-49 and Fig. 4). While Maydan in view of Coomer explicitly describes a mechanism for holding a substrate rather than a substrate fixing jig, the use of the securing member to secure a jig rather than a substrate represents a claim of intended use that does not patentably distinguish the structure of the claimed invention from a prior art structure capable of being operated in the same

manner (see MPEP 2114). The securing means of Maydan is capable of holding a substrate fixing jig.

16. **Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maydan in view of Coomer as applied to claims 1-7, 9-10, and 14 above, and in further view of Yoshioka (US Patent Application No. 2002/0079057).**

17. Regarding claim 8, Maydan in view of Coomer describes a mechanism (50) to hold a substrate, but does not describe mechanism in which the securing mechanism secures the jig by magnetic force. However, Yoshioka describes an apparatus in which a work piece is held and transferred in a vacuum using a magnetic force (**magnetic chuck**), and that such a magnetically-actuated holder can be used to transfer the substrate through the load-lock chambers of the apparatus without exposing the substrate to the atmosphere (Yoshioka: paragraph 85). One of ordinary skill in the art at the time of the invention would have recognized the use of a magnetic securing means to hold and transfer a substrate in a vacuum chamber as the obvious selection of an art-recognized solution for the same intended use (see MPEP 2144.07).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maydan in view of Coomer as applied to claims 1-7, 9-10, and 14 above, and further in view of Stevenson (US Patent No. 5421979).

18. Regarding claim 11, Maydan in view of Coomer describes a processing chamber (column 3, lines 30-35), but does not explicitly describe a sputtering deposition or CVD mechanism. However, Stevenson teaches a substrate transport system comprising a rotating substrate holding system (**substrate transporter 100**) in which a sputtering

process is used to deposit a film (Stevenson: column 1, lines 13-19, column 6, lines 56-34, and Fig. 1). One of ordinary skill in the art at the time of the invention, desiring to form a surface coating on a substrate in the apparatus of Maydan in view of Coomer, would have found the use of a sputter technique in the process chamber to be an obvious use of an art-recognized method that would not provide any new and unexpected benefit.

19. **Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maydan in view of Coomer as applied to claims 1-7, 9-10, and 14 above, and in further view of Tezuka (US Patent No. 4771730).**

20. Regarding claim 12, Maydan in view of Coomer teaches the use of a processing chamber to process a substrate, but does not explicitly teach one of a plasma exposure means, an ion irradiating means, or an etching means. However, it was known in the art at the time of the invention, as taught by Tezuka, that sputtering, ion etching, and plasma CVD are all common techniques for processing a substrate in a vacuum chamber (Tezuka: column 1, lines 6-18). One of ordinary skill in the art at the time of the invention, motivated by a need to process the substrate in the apparatus of Maydan in view of Coomer via ion etching or plasma CVD would therefore have found it obvious to install a plasma exposing means, an etching means, or an ion irradiation means to the processing chamber of Maydan in view of Coomer with no new and unexpected benefit.

Allowable Subject Matter

Claims 13 and 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. Regarding claim 13, Maydan describes a securing means (**clip 50**) wherein the substrate is held against the substrate holder (**pedestal 22**) (Fig. 4), but does not teach a bent substrate fixing jig and a gap between the substrate fixing jig and the substrate holder when the substrate jig is mounted to the holder.

22. Claims 15-16 are dependent on claim 13.

Response to Arguments

Applicant's arguments filed 12/15/2010 have been fully considered but they are not persuasive.

23. Regarding claim 1, applicant argues that the amended claim 1, which recites a rotating substrate holder having a shaft oriented in a horizontal direction, and a transfer arm that is insertable into a gap between the substrate holder and the substrate, wherein the arm, when holding the substrate fixing jig or the substrate itself, is transferred along the outer circumferential surface of the cylindrical substrate holder, patentably distinguishes the claimed invention. The examiner maintains that such a transfer arm, in which the arm is inserted into a gap between the substrate and the substrate holder, was taught at the time of the invention by Coomer as described in detail in paragraphs 3-6 above. The examiner further notes that the **robot 60** and **actuator arm 64** of Maydan are located outside the evacuable chamber (6) and in a separate load-lock chamber (7), as illustrated in Fig. 5 of Maydan.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert Hilton whose telephone number is (571)-270-5519. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Albert Hilton/
Examiner, Art Unit 1716

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